

1 What is claimed is:

2 1. An imaging system comprising:

3 an imager having an array of photocells, where each photocell produces an electrical
4 response to light exposure, and the electrical responses of the array of photocells together
5 represent spatial frequency-domain image data; and

6 an image processor that receives the spatial frequency-domain image data from the
7 imager and transforms the spatial frequency-domain image data into spatial-domain image data.

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9 2. The imaging system of claim 1, where the spatial frequency-domain image data contains
10 noise, the system further comprising a filter that detects and removes the noise before the system
11 transforms the spatial frequency-domain image data into spatial-domain image data.

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13 3. The imaging system of claim 1, further comprising a user interface that displays the
14 spatial-domain image data.

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16 4. The imaging system of claim 1, further comprising an optical lens placed between a
17 spatial representation of an image object and the imager, the optical lens performing an
18 approximate Fourier transform on light emanating from the spatial representation of the image
19 object toward the imager.

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21 5. The imaging system of claim 4, where the spatial representation of the image object is
22 provided by a spatial light modulator.

1 6. The imaging system of claim 4, further comprising a coherent light source for
2 illuminating the spatial representation of the image.

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4 7. The imaging system of claim 1, further comprising:
5 a focusing lens and a transform lens that are placed between the imager and an image
6 object;
7 light traveling from the image object to the imager;
8 the focusing lens focusing the light onto an image plane between the focusing lens and
9 the transform lens;
10 the transform lens receiving the light from the focusing lens and bending the light to form
11 a diffraction pattern of the image object at a transform plane of the transform lens; and
12 the imager being placed at the transform plane of the transform lens to capture the
13 diffraction pattern of the image object..

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15 8. The imaging system of claim 7, further comprising a user interface that permits a user to
16 adjust distances between the focusing lens, the transform lens, and the imager.

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18 9. An imaging system comprising:
19 digital imaging means for capturing a diffraction pattern of an object illuminated by an
20 incoherent light source;
21 digital imaging means for producing digital spatial frequency-domain image data
22 corresponding to the captured diffraction pattern of the object; and

means for converting the spatial frequency-domain image data into spatial-domain image data suitable for spatial image display of the object.

10. The imaging system of claim 9, further comprising means for detecting and removing noise from the spatial frequency-domain image data.

11. The imaging system of claim 9, further comprising means for displaying a spatial image of the object.

12. The imaging system of claim 9, further comprising means for storing the spatial-domain image data of the object.

13. The imaging system of claim 9, further comprising user interface means for controlling an amount of time for capturing the image.

14. The imaging system of claim 9, further comprising user interface means for controlling an amount of illumination for capturing the image.

15. A method that minimizes point defects in an image, comprising:
capturing a diffraction pattern of an image object;
producing digital spatial frequency-domain image data corresponding to the captured diffraction pattern of the object; and
converting the spatial frequency-domain image data to a spatial domain.

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2 16. The method of claim 15, further comprising detecting and removing noise from the
3 captured spatial frequency-domain image data.

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5 17. The method of claim 15, further comprising transferring the spatial frequency-domain
6 image data to an image processor, the image processor inverse Fourier transforming the
7 frequency-domain image data to a spatial domain.

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9 18. The method of claim 15, further comprising placing a transform lens between an image
10 object and the digital imager, the transform lens performing an approximate Fourier transform on
11 light traveling between the object and the digital imager.

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13 19. The method of claim 15, further comprising storing the spatial-domain image data in
14 digital memory.

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16 20. The method of claim 15, further comprising displaying the spatial-domain image data.

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18 21. An imaging system comprising:
19 means for capturing an image in the spatial frequency domain;
20 means communicatively coupled with the capturing means for creating a digital
21 representation of the spatial frequency components of the captured image; and

means communicatively coupled with the digital representation creation means for transforming the digital representation of the spatial frequency components into spatial-domain image data.

22. A system for minimizing point defects in an image, comprising:

means for capturing a diffraction pattern of an image object;

means communicatively coupled with the capturing means for producing digital spatial frequency-domain image data of the captured diffraction pattern of the object; and

means coupled with the data-producing means for converting the spatial frequency-domain image data to a spatial domain.